



Dan Skopec
Acting Secretary

California Regional Water Quality Control Board North Coast Region

William R. Massey, Chairman

www.waterboards.ca.gov/northcoast
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Arnold
Schwarzenegger
Governor

May 15, 2006

Ms. Julie B. Raming
Georgia-Pacific Corporation
P.O. Box 105605
Atlanta, GA 30348-5605

Dear Ms. Raming:

Subject: Draft Human Health and Ecological Risk Assessment Workplan

File: Georgia-Pacific Fort Bragg Sawmill, 90 West Redwood Avenue, Fort Bragg
Case No. 1NMC462

Thank you for the document from Tetra Tech, Inc. entitled *Draft Human Health and Ecological Risk Assessment Workplan for the Georgia-Pacific California Wood Products Manufacturing Facility* (Plan), regarding the Georgia-Pacific Fort Bragg sawmill site, received by this office February 1, 2006. We have had the Plan reviewed by our sister agency the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA).

Enclosed with this letter is a memorandum from Mr. James Carlisle of OEHHA, commenting on the Plan. Those comments should be addressed through the preparation of a revised Plan.

I have also reviewed the Plan and have the following additional comments:

- Soils that would present a different risk if the depth of the soil were changed (e.g., deeper soils being brought to the surface during grading activities) need to be identified as such in the final risk assessment.
- Plan section 3.1.4, which is a summary of the Phase II environmental site assessment, only contained references to hydrocarbon, VOCs, and pesticide detections. Other constituents were also detected during that investigation and should be noted in that summary.
- In Plan section 5.1 ("Identification of Chemicals of Potential Concern"), it was stated that "The most recent data available for four monitoring events (i.e., one year) will be used preferentially in identifying COPCs in groundwater, as is typically preferred by the RWQCB." I am not certain as to the implications of this statement for the risk assessment, but all groundwater monitoring data from the site should be used in the determination of COPCs.
- Regarding exposure pathways (Plan section 5.2.1), bluff erosion could change subsurface soils into surface soils near the coast, creating new exposures.

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- Also regarding exposure pathways, it was stated in Plan section 5.2.1 that, because some of the industrial ponds might be filled, "... in the future, exposures may be limited to surface water and sediments in Ponds 6 and 8 and the de-barker pond." It is also possible that the ponds might not be filled and that exposures to surface water and sediments from all the ponds is possible.
- In Appendix B-1, section 2.0 ("Approach for identifying Chemicals of Potential Concern"), it was stated that "Chemicals detected more than once in groundwater or detected in a well with free-product were identified as COPCs". Using that method, which chemicals were detected just once in groundwater and were thus not identified as COPCs?
- In Appendix B-1, section 3.2 ("Identify Potentially Complete Exposure Pathways"), it was stated that "Potentially incomplete exposure pathways are not evaluated in this evaluation." The exclusion of an exposure pathway from the development of risk-based screening criteria (which is the subject of Appendix B-1) because the pathway is potentially incomplete does not appear appropriate. The inclusion of a pathway because it is potentially complete would seem more appropriate.
- In Appendix B-1, section 3.5, the target risk level was identified as 1 in 100,000 (10^{-5}). The target risk level of 1 in 1,000,000 (10^{-6}) should be used for developing the risk-based screening criteria.
- Also in Appendix B-1, risk-based screening criteria for chemicals in groundwater were calculated. The appropriate water quality objectives will also need to be used. In addition, when a final remedial action plan is developed for this site, the potential for remediating groundwater to background levels will need to be addressed.
- In Appendix B-1, section 4, more explanation should be provided for using a dilution-attenuation factor of 3.5, including how site-specific conditions were used in the calculation.
- Table B-2.2 contained measured soil physical data. However, the source of the data was not clear. The date those samples were collected should be included and the document in which these data were originally reported should be identified.

Please submit a revised Plan, addressing my comments and the OEHHA comments. In addition, through the revised Plan, you should respond to the comments on the Plan submitted to you by Mr. Mark Stelljes of SLR International Corp., consultant for the City of Fort Bragg and by Mr. David Berry, a member of the public. If I receive any additional public comments on the Plan, I will transmit them to you.

If you have any questions, you may contact me at (707) 570-3767 or chunt@waterboards.ca.gov.

Sincerely,

/ORIGINAL SIGNED BY/

Craig Hunt
Water Resource Control Engineer

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Enclosure

cc: Acton Mickelson Environmental, Inc., 5175 Hillsdale Circle, Suite 100, El Dorado Hills, CA 95762
Ms. Kay M. Johnson, Tetra Tech, Inc., 3746 Mt. Diablo Boulevard, Suite 300, Lafayette, CA 94549
Mr. Doug Heitmeyer, Georgia-Pacific Corporation, 90 West Redwood Avenue, Fort Bragg, CA 95437
Ms. Linda Ruffing, City Manager, City of Fort Bragg, 416 N. Franklin Street, Fort Bragg, CA 95437
Mendocino County Environmental Health Department, 501 Low Gap Road, Room 1326, Ukiah, CA 95482
Mr. Dave Goble, Public Works Department, 416 N. Franklin Street, Fort Bragg, CA 95437
Ms. Loie Rosenkrantz, 17201 Franklin Road, Fort Bragg, CA 95437
Mr. David L. Berry, Department of Toxic Substances Control, P.O. Box 806, Sacramento, CA 95812
Ms. Ashle Crocker, Remy, Thomas, Moose, and Manley, 455 Capitol Mall, Suite 210, Sacramento, CA 95814
Mr. Glenn S. Young, Fugro West, Inc., 1000 Broadway, Suite 200, Oakland, CA 94607
Mr. Mark Stelljes, SLR International Corp, 117 Burgundy Court, Martinez, CA 94553
E-mail cc list

Office of Environmental Health Hazard Assessment



Dan Skopec
Acting Agency Secretary

Joan E. Denton, Ph.D., Director
Headquarters • 1001 I Street • Sacramento, California 95814
Mailing Address: P.O. Box 4010 • Sacramento, California 95812-4010
Oakland Office • Mailing Address: 1515 Clay Street, 16th Floor • Oakland, California 94612



Arnold Schwarzenegger
Governor

MEMORANDUM

R W Q C B
REGION 1

MAY - 5 2006

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☐ LGR ☐ RRK
☐ RLT ☐ PCG

TO: Craig Hunt
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

FROM: James C. Carlisle, D.V.M., Senior Toxicologist
Integrated Risk Assessment Branch

DATE: May 2, 2006

SUBJECT: REVIEW OF TETRA-TECH HHERA WORKPLAN

Per your 2/15/06 request, I have reviewed the human health portion of the Draft Human Health and Ecological Risk Assessment Workplan for the Georgia-Pacific, CA, Wood Products Manufacturing Facility, prepared by Tetra-Tech, Inc., dated January 2006. My review focused primarily on the risk assessment. My draft comments follow.

COPCs

- DTSC February 1997 guidance on metals background should be followed. Figure b2 does not appear to be consistent with that Guidance. Eliminating metals from further consideration if they are less than the 75th percentile statewide is not consistent with OEHHA or DTSC recommendations.
- Inorganics should not be eliminated in a single elimination scheme. All information should be considered together. Probability plots and spatial analysis are useful tools discussed in DTSC guidance that should be utilized. The sample probability plot (appendix C figure 1) is a good example, showing 5 outliers (possibly contaminated). Adding off-site background sample values (preferably color-coded) will complete the figure.
- OEHHA prefers that all organic chemicals be included as COPCs. If there are regional sources, these can be discussed under risk management.
- 6.1.3: It is unclear why COPCs are discussed again under this section. I would expect that a single set of COPCs would be identified for each medium (sediment being the possible exception).

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The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption.

Exposure pathways

- It is not clear why residents might not also be exposed to pond water and sediments. Residential and recreational scenarios may be additive (obviously not to exceed 24 hrs/day), since residents may also use the trails etc.
- The bullets on page 20 to not clarify which pathways will be considered complete for which exposure scenarios.

Other Comments

- 5.3: OEHHHA RELs should also be consulted.
- The lists of receptors of ecological concern in 6.1.2.2 and 6.2.1 are much more comprehensive than the list of functional groups represented by the 3 indicator species on page B10. The final list of species to be evaluated is incomplete.
- Section 6.1.4: I do not recommend eliminating the sediment-to-avian-and/or-mammalian-piscivore pathway. Even if there are no fish (which would be surprising) piscivores could be eating aquatic stages of amphibians. Great blue herons and egrets have been seen feeding on the site.
- An iterative approach to evaluating marine sediments and/or intertidal biota should be considered. Sediment-bound chemicals should be much more concentrated in areas upstream from marine outfalls such as the mill pond. If assessment of these areas indicates no threats to benthic organisms or to predators via movement up the food chain, then assessment of the marine environment in which the chemicals would be significantly diluted, seems unnecessary. Conversely, if upstream areas have elevated concentrations of bioaccumulative chemicals, or if chemicals could have been introduced into the marine environment directly, thereby bypassing these upstream sampling points, then some sediment and/or intertidal biota sampling and evaluation near the outfalls may be appropriate.
- Section 6.1.4 states that the dermal route will not be considered, while 6.2.2 discusses exposure factors for the dermal pathway. Please explain or correct.
- 6.2.2: Exposure point concentrations should be based on a UCL of the mean for an area compatible with range of the species in question. This is particularly true if the individual, rather than the population, is being protected.
- 6.2.3.1: While I agree that reproductive impairment is tied directly to maintenance of population structure, other types of impairment should not be excluded without serious consideration of indirect effects on the population. While humans may receive supportive medical care and thus be able to reproduce and rear young despite serious health impairments, this is not likely to be the case with wildlife. Small physical or physiological changes may render the animal unable to find and catch prey or to escape predators, let alone reproduce. However, I recognize that the TRVs are what they are and they are all we have.

- Page B-5 The relationship of the 2 equations to one another is unclear to me. Both give a concentration in air in mg/m^3 . Please follow EPA SSL guidance.
- Page B-5 RBSCs for soil may be used to drive initial remediation, but post-remedial confirmation should be based on soil vapor measurements.
- Page B-7: Additivity of risks is appropriately considered. Target risk is a risk management decision that should be made in conjunction with RWQCB Region 1. However, I note that in my experience, 10^{-5} is frequently used by various RWQCB regions as a target level for aggregate risk.
- Table B-1.1: It would be helpful for this table to have some explanation of what the list of chemicals represents. Is it a list of all chemicals detected? Is it a subset? If so, those that were eliminated as COPCs should be listed along with the reason they were omitted.
- Table B-1.5: Residential RBSCs for non-carcinogens are typically based on children.
- The chromium RBSC should consider hexavalent chromium.
- A revised version of Table B 2.4 has been provided to me by Tetra-tech. This should be made part of the workplan.
- Chapter 6 of the main text and section 4 of Appendix B both cover ecological assessment. It would be less confusing and save review time if these were combined in a single documentation of this activity.
- Figure 9: The equations for the total dose to herbivores, carnivores, and insectivores are incorrect. As written, the last 2 terms in each would not be multiplied by $\text{IR} \times \text{SPI} \times \text{BW}^{-1}$. The last 4 terms should be enclosed by a single parenthesis. I presume this is a typographical error, since the preceding equations seem to be correct. SPI has been omitted from the carnivore equation. I do not believe that SPI should be in hectares, since this would introduce incorrect units into the final dose. It should be a unitless ratio of the site area to the home range area with a maximum value of one. Figure 9 equations do not include the inhalation pathway.
- The ecological assessment methodology needs further clarification. Page 35 indicates nine functional groups to be assessed (I have already indicated that piscivorous birds or mammals should be included). However, I was unable to locate supporting information for these nine guilds in the appendices. Table 9 shows exposure factors for several species, but it is not clear how these will be used. Table B1.7 shows exposure factors for plants and a single animal. However, being unable to find bio-uptake factors for plants or insects, I could not calculate dosages for even this one species.
- I do not see equations or calculations for concentration in prey species.
- Table B3.11 needs further explanation. I presume that the last 2 columns are meant to summarize the preceding 7 columns. Since the title of the table is "Ecological RBSCs" why not use the same term for the heading of columns 8 & 9 to avoid confusion (if that is what those columns represent). Some of the entries in columns 8

& 9 appear to be rounded, but this is very inconsistent. In some cases it is also incorrect: for example 0.521 becomes 0.5, not 1, when rounded to 1 significant figure. It appears that the inhalation pathway is considered separately, not additively.

- The ecological risk assessment workplan is too sketchy for me to render an opinion on its overall adequacy.

Comments on the comments

- Other commentors have expressed the opinion that 10^{-5} is an inappropriate target risk for RBSCs, that additivity is not considered, and that chemicals will be screened out (not quantitatively assessed) based on a chemical by chemical risk of 10^{-5} , which could lead to a cumulative risk of over 10^{-4} .
If, indeed, the intent is to screen out chemicals based on a chemical by chemical risk of 10^{-5} , I would agree with this comment. However, I do not believe that this interpretation of the use of the RBSCs is correct (see section 3.6.1, which states that RBSCs will be used in an additive manner, resulting in chemical by chemical risks approaching 10^{-6}).
- Other commentors have expressed the opinion that the RBSCs for soil are inappropriate because they do not include inhalation of resuspended soil particles. Page 23 states that resuspension and inhalation will be included as a pathway.
- There are some comments on soil sampling depth. I agree that if contaminants are mainly on the surface, then depth-averaging can dilute the apparent concentration. However if contamination is deeper (up to 10 feet for residential) then this should be considered inasmuch as there could be mixing during grading and construction. DTSC guidance should be followed.
- One commenter compares RBSCs based on the deer mouse with TRVS for other species. While I agree that other species including predators should be evaluated, RBSCs and TRVs are not directly comparable.

If you have any questions, please e-mail or call me at (916) 323-2635 or 214-2635.

Reviewed by:



Hristo Hristov, M.D., Staff Toxicologist
Integrated Risk Assessment Branch